The contributions of body mass index to brain atrophy in relapsing remitting multiple sclerosis

QUINNIPIAC UNIVERSITY
FRANK H. NETTER MD
SCHOOL OF MEDICINE

Trinity Health Of New England | Mandell MS Center

Evan Thomson[1], Zaenab Dhari, MD[1,2], Jennifer A. Ruiz, DPT[1,2] Lori Laddaran[1], Derek Paradis[1], John Garcia[1], MPH, MSc[3], Ashley Paro[1], Lindsay O. Neto, MPH[1,2], Marco Pisa, MD[4], Gabriele C. De Luca MD, DPhil [4] & Elizabeth S. Gromisch, PhD[1,2,3]

[1] Department of Medical Sciences, Frank H. Netter MD School of Medicine at Quinnipiac University, North Haven, CT
[2] Mandell Center for Multiple Sclerosis, Mount Sinai Rehabilitation Hospital, Trinity Health Of New England, Hartford, CT
[3] Department of Neurology, University of Connecticut School of Medicine, Farmington, CT
[4] Department of Clinical Neurosciences, Oxford University Hospital, Oxford, UK

INTRODUCTION

Obesity is among the most commonly observed cardiovascular comorbidities in multiple sclerosis (MS). Previous research has recorded a causal link between cardiovascular issues and MS; however, this study seeks to analyze the specific impact of body mass index (BMI), which is still debatable. Increased BMI is associated with a sedentary lifestyle, systemic inflammation, and other traditional vascular risk factors, which are all known causes of accelerated brain aging, therefore BMI contribution to brain atrophy with respect to MS alone is significantly confounded.

OBJECTIVES

To determine whether (BMI) is predictive of brain volume reductions observed in a clinically representative group of persons with relapsing-remitting multiple sclerosis (RRMS) after considering demographics, MS, and cardiovascular related risk factors, among other well documented clinical and patient characteristics.
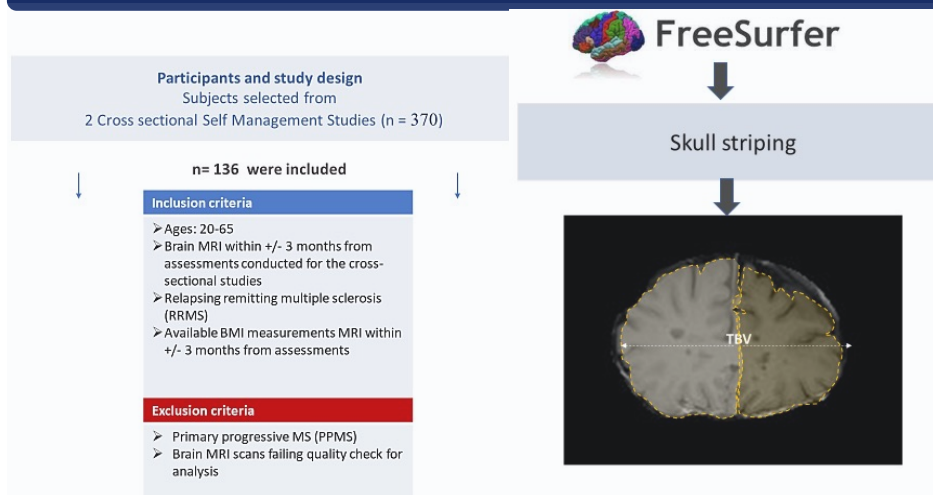
METHODS

Fig 1 Methods and design

RESULTS

Independent from cardiovascular comorbidities, **higher BMI negatively predicted total brain volume among persons with RRMS**. Our data suggest that elevated BMI plays a significant role in RRMS related brain volume alterations even after controlling for traditional vascular risk factors, providing further insight into the potential pathological mechanisms related to higher BMI in this unique cohort. Obesity is a modifiable risk factor that can be targeted with different interventional strategies. Future studies are necessary to explore whether lowering BMI can have a positive impact on brain volume in MS.

CONCLUSION

Higher BMI negatively predicted total brain volume among persons with RRMS. Our data suggest that elevated BMI plays a significant role in RRMS related brain volume alterations even after controlling for traditional vascular risk factors, providing further insight into the potential pathological mechanisms related to higher BMI in this unique cohort.

RESULTS

Descriptive statistics of study subjects:
86.6% White, 75% females, disease duration=11.3± 6 with 75% being on DMT)

Statistics

		Age	BMI
N	Valid	136	136
	Missing	0	0
Mean		49.75	29.1126
Std. Deviation		10.385	7.86070
Skewness		-.707	1.422
Std. Error of Skewness		.208	.208
Kurtosis		-.167	2.281
Std. Error of Kurtosis		.413	.413

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Collinearity Statistics Tolerance	VIF
1	(Constant)	1756.951	73.692		23.842	.000	1611.083	1902.819		
	Age	.235	.930	.019	.253	.801	-1.605	2.075	.865	1.156
	Acohol	1.823	6.083	.021	.300	.765	-10.217	13.864	.965	1.036
	sex	-5.470	21.332	-.018	-.256	.798	-47.694	36.755	.930	1.075
	MS duration YEARS	-.394	1.540	-.019	-.256	.799	-3.442	2.654	.901	1.110
	Cardiovascular comorbidities (yes/no)	-62.089	23.243	-.239	-2.671	.009	-108.096	-16.081	.593	1.685
	other Comorbidities (yes/ no)	16.757	23.041	.065	.727	.468	-28.853	62.366	.604	1.656
	Ethnicity white 1/ no white 0	19.683	27.886	.052	.706	.482	-35.516	74.883	.886	1.129
	BMI	-8.720	1.341	-.529	-6.503	.000	-11.374	-6.066	.719	1.390
	DMT	4.300	22.529	.014	.191	.849	-40.295	48.895	.834	1.199
	Hxsmoking	28.025	21.582	.094	1.299	.197	-14.695	70.744	.909	1.101

a. Dependent Variable: Total Brain

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